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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/564,884	01/17/2006	Keiko Shibata	648.45478X00	3701
20457 7590 08/28/2009 ANTONELLI, TERRY, STOUT & KRAUS, LLP 1300 NORTH SEVENTEENTH STREET SUITE 1800 ARLINGTON, VA 22209-3873				
EXAMINER SASAKI, SHOGO				
ART UNIT 1797		PAPER NUMBER		
NOTIFICATION DATE 08/28/2009		DELIVERY MODE ELECTRONIC		

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

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### Office Action Summary

**Application No.**

10/564,884

**Applicant(s)**

SHIBATA, KEIKO

**Examiner**

Shogo Sasaki

**Art Unit**

1797

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --  
**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 8/20/2009.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1, 2, 9, 12, 15 and 16 is/are pending in the application.
- 4a) Of the above claim(s) 2, 12 and 16 is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1, 9 and 15 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 1/17/2006 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- 1) ☐ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO/SB/08)  
Paper No(s)/Mail Date \_\_\_\_\_
- 4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date \_\_\_\_\_
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: \_\_\_\_\_

## DETAILED ACTION

### ***Continued Examination Under 37 CFR 1.114***

1. A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on 8/20/2009 has been entered.
2. Amendments to the claims (filed on 7/20/09 and 8/20/09) are acknowledged. Cancellations of claims 3-8, 10, 11, 13 and 14 are also acknowledged.

### ***Claim Interpretations***

3. Regarding claim 1, the limitations "to which a methanol water mixture and a sample comprising nitropolycyclic aromatic hydrocarbons are sent," "for receiving the methanol water mixture and the sample from the auto-sampler and separating the sample comprising nitropolycyclic aromatic hydrocarbons into at least four separate nitropolycyclic aromatic hydrocarbons including 1-nitropyrene, 1,3-dinitropyrene, 1,6-dinitropyrene and 1,8-dinitropyrene" and "for receiving the at least four separate nitropolycyclic aromatic hydrocarbons including 1-nitropyrene, 1,3-dinitropyrene, 1,6-dinitropyrene and 1,8-dinitropyrene from the separation column and aminating the separated nitropolycyclic aromatic hydrocarbons," which are directed to the manner in which a claimed apparatus is intended to be used do not distinguish the claimed apparatus from the prior art. These limitations do not further structurally limit the claimed apparatus.

Also, "a methanol water mixture" and "a sample" are not claimed as part of the claimed subject matter. Any further references to said elements were not given patentable weight even if those references further limit said unclaimed element. Said recitation does not structurally limit claims.

***Specification***

4. As previously presented, the specification is objected to as failing to provide proper antecedent basis for the claimed subject matter. See 37 CFR 1.75(d)(1) and MPEP § 608.01(o). Correction of the following is required: The separation column specifically designed to separate a sample into four specific isomers of nitro-PAH lacks antecedent basis.

***Claim Rejections - 35 USC § 102***

5. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

6. Claims 1 and 9 are rejected under 35 U.S.C. 102(b) as being anticipated by Iwabuchi (IDS: JP2001-21497: Translation from Patent Abstracts of Japan provided with this office action.).

Regarding claims 1 and 9, Iwabuchi discloses an apparatus for analyzing polycyclic aromatic hydrocarbon comprising (Abstract; Solution; Fig. 4, Fig. 7 and "Description of Notation" in column 6; claim 2; and [0015]-[0018]):

- an auto-sampler (7);
- a separation column downstream of the auto-sampler (9);
- a reduction column downstream of the separation column (17); and
- a fluorescence detector (20); and
- wherein the reduction column is alumina/platinum-rhodium reduction column ([0011]).

***Claim Rejections - 35 USC § 103***

7. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

8. The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

9. Claim 15 is rejected under 35 U.S.C. 103(a) as being unpatentable over Iwabuchi (IDS: JP2001-21497).

Regarding claim 15, Iwabuchi discloses all of the limitations as set forth above.

Iwabuchi does not explicitly disclose the use of C8 column. Iwabuchi uses C18 (ODS) column ([0015]). However the difference between C8 and C18 silica columns are merely in the degrees of hydrophobicities (longer branch of (CH)<sub>x</sub>-silane versus shorter ones). The C18 would have been more than capable of separating compounds. The instant application is silent to unexpected result in separating nitro PAHs due to the selection of a particular silica packing columns (Also see paragraph 4 above.).

It would have been obvious to one having ordinary skill in the art at the time of the invention to modify the invention of Iwabuchi and replace C18 with C8 column, since it was within the general skill of a worker in the art to select a known material on the basis of its suitability for the intended use. Examiner asserts that the substitution would not affect the operability of Iwabuchi's column 9.

Further, the use of a known column material in the system of Iwabuchi would amount to nothing more than a use of a known packing material for a separation column for its intended use in a known environment to accomplish an entirely expected result.

10. Claims 1, 9 and 15 are rejected under 35 U.S.C. 103(a) as being unpatentable over Li (Determination of mono- and di-nitro polycyclic aromatic hydrocarbons by on-line reduction and high-performance liquid chromatography with chemiluminescence detection).

Regarding claim 1, Li et al. disclose an apparatus for analyzing nitropolycyclic aromatic hydrocarbon comprising (Abstract):

- a reduction column (P178/Experimental);
- a separation column downstream of the reduction column; and
- a fluorescence detector ("2.2.Instrumentation," P178-179/L26-27).

As applicant pointed out, the two columns of Li are in reverse order with respect to the configuration of the apparatus in instant claims.

However, it would have been obvious to one having ordinary skill in the art at the time of the invention to reverse the order of two columns in the system taught by Li, since rearrangement of parts or the change in configuration of an invention only involves routine skill in the art. Li discloses that methanol is not appropriate for the detection of the separated compound (P179, column 1), but Li does not say that methanol-water mobile phase would not work with the detection (See P181, column 1, second paragraph). The portion of Li that applicant cited merely states the preference. Examiner asserts that the reconfiguration of the columns in the system of Li would not have affected the operability of Li's system.

Also, Li does not explicitly disclose the use of auto-sampler.

However, it would have been obvious to one having ordinary skill in the art at the time of the invention to automate the loading of samples into the separation/analysis device using an auto-sampler, since providing a mechanical or automatic means to

replace manual activity which accomplished the same result involves only routine skill in the art.

Regarding claim 15, Li discloses all of the limitations as set forth above.

Li et al. further disclose that the samples containing isomers of aminated nitro polycyclic aromatic hydro carbon are separated by a C18 silica column ("2.5. Diesel exhaust sample," P179/L5-8; Fig. 2; and "2.2.Instrumentation").

Li does not explicitly disclose the use of C8 column. Li uses C18 column. However the difference between C8 and C18 silica columns are merely in the degrees of hydrophobicities (longer branch of  $(CH)_x$ -silane versus shorter ones). The C18 would have been more than capable of separating compounds. The instant application is silent to unexpected result in separating nitro PAHs due to the selection of a particular silica packing columns (Also see paragraph 4 above.).

It would have been obvious to one having ordinary skill in the art at the time of the invention to modify the invention of Li and replace C18 with C8 column, since it was within the general skill of a worker in the art to select a known material on the basis of its suitability for the intended use. Examiner asserts that the substitution would not affect the operability of Li's separation column.

Further, the use of a known column material in the system of Li would amount to nothing more than a use of a known packing material for a separation column for its intended use in a known environment to accomplish an entirely expected result.

Regarding claim 9, Li discloses all of the limitations as set forth above.

Li further disclose that the reduction column contains platinum/rhodium catalyst ("2.3. Online reduction," P178/L1-3).

Li does not explicitly disclose that platinum/rhodium catalyst is on alumina carrier. However the catalyst of Li must also have been provided on an inert carrier. Alumina and silicate, such as zeolites are well known carrier for the catalyst. Choosing from a finite number of possible solutions is obvious.

It would have been obvious to one having ordinary skill in the art at the time of the invention to choose alumina as an inert support for the catalyst, since it was within the general skill of a worker in the art to select a known material on the basis of its suitability for the intended use.

Further, the use of a known inert carrier such as alumina in the system of Li. would amount to nothing more than a use of a known carrier for a metallic catalyst for its intended use in a known environment to accomplish an entirely expected result.

### ***Response to Arguments***

11. Applicant's arguments filed 7/20/2009 and 8/20/2009 have been fully considered but they are not persuasive (See paragraph 10 above).

Applicant argues that the two columns of Li are in reverse order with respect to the configuration of the apparatus in instant claims. The reduction column of Li is indeed upstream of the separation column. Applicant implies that the system of Li would not be operable since Li states that the methanol-water mobile phase for the reduction column is not appropriate for the detector downstream of the two columns.

However, Li does not say that the methanol-water mobile phase would not work with the detection (See P181, column 1, second paragraph). The portion of Li that applicant cited merely states the preference of the acetonitrile mobile phase in the separation column. Examiner asserts that the reconfiguration of the columns in the system of Li would not have affected the operability of Li's system, because using the same mobile phase (methanol-water) in both columns would not have been fully compromised the system of Li. One of ordinary skill in the art would have been motivated to rearrange the system of Li and used the same mobile phase in both columns.

### ***Conclusion***

12. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Shogo Sasaki whose telephone number is (571)270-7071. The examiner can normally be reached on Mon-Thur, 10:00am-6:30pm, EST.



If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Jill Warden can be reached on 571-272-1267. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

SS

8/24/2009

/Brian R Gordon/

Primary Examiner, Art Unit 1797